

What is claimed is:

1. A method for automotive evaporative leak detection for use with a system having a tank with a vapor pressure having a known value at a first point in time, the method comprising the steps of:

- a. measuring and recording a first temperature of the vapor at substantially the first point in time;
- b. measuring and recording the temperature and pressure of the vapor at a second point in time;
- c. computing a temperature-compensated pressure based on previously measured values; and
- d. comparing the temperature-compensated pressure with the pressure measured at a second point in time to detect a leak.

2. The method according to claim 1, wherein temperature-compensated pressure is computed as a function of the pressure measured at the first point in time and of the measured temperatures.

3. The method according to claim 2, wherein the function comprises the expression:

$$P_c = P_1 (2 - T_2/T_1)$$

where  $P_c$  is temperature-compensated pressure,  $T_1$  is the temperature at the first point in time and  $T_2$  is the temperature at the second point in time.

4. A method for making temperature-compensated pressure readings in an automotive evaporative leak detection system having a tank with a vapor pressure having a value known at a first point in time, comprising the steps of:

- a. measuring a first temperature of the vapor at substantially the first point in time;

- b. measuring the temperature of the vapor at a second point in time; and
- c. computing a temperature-compensated pressure based on the previously measured values.

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5. The method according to claim 4, wherein the temperature-compensated pressure is computed as a function of the pressure measured at the first point in time and of the temperature measured at the first and second points in time.

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6. The method according to claim 5, wherein the function comprises the expression:

$$P_c = P_1 (2 - T_2/T_1)$$

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where  $P_c$  is the temperature-compensated pressure,  $P_1$  is the pressure measured at the first point in time,  $T_1$  is the temperature measured at substantially the first point in time and  $T_2$  is the temperature measured at the second point in time.

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7. In an automotive evaporative leak detection system, a temperature-compensated pressure sensor comprising:

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- a. a pressure sensing element;
- b. a temperature sensing element;
- b. a processor coupled to the pressure sensing element and to the temperature sensing element and receiving, respectively, pressure and temperature signals therefrom; and
- c. logic implemented by the processor for computing a temperature-compensated pressure on the basis of a pressure and temperature measurements.

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8. The sensor according to claim 7, wherein the temperature-compensated pressure is computed as a function of the pressure at a first point in time and the temperature measured at substantially the first point, and at a second point, in time.

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9. The sensor according to claim 8, wherein the function comprises the expression:

$$P_c = P_1 (2 - T_2/T_1)$$

where  $P_c$  is the temperature-compensated pressure,  $P_1$  is the pressure measured at the first point in time,  $T_1$  is the temperature measured at substantially the first point in time, and  $T_2$  is the temperature measured at the second point in time.

10. In an automotive evaporative leak detection system, a sensor subsystem for compensating for the effects on pressure measurement of changes in the temperature of the fuel tank vapor, the subsystem comprising:

- a. a pressure sensor in fluid communication with the fuel tank vapor;
- b. a temperature sensor in thermal contact with the fuel tank vapor;
- c. a processor in electrical communication with the pressure sensor and with the temperature sensor; and
- d. logic implemented by the processor for computing a temperature-compensated pressure based on pressure and temperature measurements made by the pressure and temperature sensors.

11. The subsystem according to claim 10, wherein the logic comprises a computation of temperature-compensated pressures as a function of pressure measured at a first point in time and of the temperature measured at the first, and at a second, point in time.

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12. The subsystem according to claim 11, wherein the function comprises:

$$P_c = P_1 (2 - T_2/T_1)$$

5 where  $P_c$  is the temperature-compensated pressure,  $P_1$  is the pressure measured at the first point in time,  $T_1$  is the temperature measured at substantially the first point in time and  $T_2$  is the temperature measured at a second point in time.

10 13. The subsystem according to claim 11, wherein the logic also determines the presence or absence of a leak based upon the temperature-compensated pressure and the pressure measured at the second point in time.

15 14. The subsystem according to claim 12, wherein the logic also determines the presence or absence of a leak based upon the temperature-compensated pressure,  $P_c$ , and the pressure measured at the second point in time,  $P_2$ .

20 15. The subsystem according to claim 14, wherein a leak is determined to exist if the pressure  $P_2$  is less than the temperature-compensated pressure,  $P_c$ .

25 16. The subsystem according to claim 14, wherein a leak is determined to exist if the pressure  $P_2$  is greater than the temperature-compensated pressure,  $P_c$ .

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